4

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/824,405 | 04/15/2004 | Masaaki Tamai | 2004_0593 | 7727 |

513 7590 05/16/2007

WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

| EXAMINER | |
|---|---|
| MASKULINSKI, MICHAEL C | |
| **ART UNIT** | **PAPER NUMBER** |
| 2113 | |
| **MAIL DATE** | **DELIVERY MODE** |
| 05/16/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/824,405 | TAMAI ET AL. | |
| | Examiner | Art Unit | |
| | Michael C. Maskulinski | 2113 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *15 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/453,216.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/15/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**Final Office Action**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 10, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuyama et al., U.S. Patent 6,397,347 B1, and further in view of Chen et al., U.S. Patent 5,968,182.

Referring to claim 1:

a. In column 4, lines 10-22, Masuyama et al. disclose a disk array with data and redundant data distributed across the array.

b. In column 4, lines 28-34, Masuyama et al. disclose that the disk array apparatus of this invention has a structure such that, if an abnormality or an error occurs in one of the disk units which will be referred to as a faulty disk unit, a part of the distributed data stored in the faulty disk unit is correctly reconstructed by the use of the remaining part of the distributed data, including the redundant data, stored in the remaining disk units (m disk drives across which the data blocks and the redundant data are distributed).

c. In column 6, lines 12-19, Masuyama et al. disclose that when the instruction is a reading instruction, the first through the fourth disk controllers

read the stored data from the first through the fourth disk units, respectively, and deliver the stored data to the disk array controller (issuing second read requests to read the data blocks and the redundant data from said m disk drives in response to said first read request sent thereto).

d. In column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller. The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode (detecting the disk drive reading from which reading of either one of the data blocks or the redundant data is no longer necessary from among said m disk drives; and issuing a read termination command to terminate reading of the one of the data blocks or the redundant data by said detected disk drive).

e. In column 4, lines 44-67 continued in column 5, lines 1-10, Masuyama et al. disclose that the faulty disk unit is temporarily disconnected as a faulty disk unit and the system operates in a temporary degenerate mode. The temporary degenerate mode is cancelled to return the disk array apparatus into a normal mode upon determination that the error was not really an error or it was correctable. However, Masuyama et al. don't explicitly disclose issue a read termination command to terminate reading of a current data block or redundant

data by the detected disk drive, wherein the detected disk drive is enabled to commence reading of a subsequent data block or redundant data without being disconnected from said disk array device.. In the Abstract, Chen et al. disclose a method and means within a hierarchical, demand/response DASD subsystem of the passive fault management type in which, upon the occurrence of fault, error, or erasure, a long device busy signal of finite duration is provided to a host CPU. Any DASD storage device subject to the anomaly is isolated from any host inquiry during this interval. It would have been obvious to one of ordinary skill at the time of the invention to include the long device busy signal of Chen et al. into the system of Masuyama et al. A person of ordinary skill in the art would have been motivated to make the modification because it is necessary to eliminate premature declarations of hard faults, failures, and errors (see Chen et al.: column 4, lines 8-30), and it is an obvious improvement over the invention Masuyama et al.

Referring to claim 2, in column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller. The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode (said control part determines that reading being executed in one remaining disk drive as

said detected disk drive is no longer necessary, and issues a read termination command to said one remaining disk drive).

Referring to claim 3, in column 5, lines 50-53, Masuyama et al. disclose a RAID 3 disk array device. The limitation of "when detecting that two or more of the disk drives cannot complete reading, said control part determines that reading being executed in other disk drives is no longer necessary, and issues a read termination command to the determined other disk drives" is inherent to a RAID 3 disk array device because a RAID 3 disk array device is only capable of reconstructing a single disk failure. Two or more disk failures in a RAID 3 disk array device render it inoperable.

Referring to claim 4, in column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller (reading has not yet completed/executed). The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode (said control part determines that reading not yet being executed in one remaining disk drive of said m disk drives is no longer necessary, and issues a read termination command to said one remaining disk drive).

Referring to claim 10, in column 7, lines 6-16, Masuyama et al. disclose that stored data stored at a position where the abnormality has occurred are rewritten to recover a state such that the stored data can be normally read. The use of a faulty

position is inhibited (said control part deletes the defective recording area of the data block from the table) and an alternate position is assigned as internal processing. This operation is called reassignment (a reassignment part, when a defect occurs in a recording area of one of the data blocks or the redundant data in said m disk drives executing reassign processing for assigning an alternate recording area to the defective recording area).

Referring to claim 15, in the Abstract, Masuyama et al. disclose a disk array apparatus. However, Masuyama et al. don't explicitly disclose that the disk array device further comprises m SCSI interfaces corresponding to said m disk drives, and wherein said control part is operable to notify each of said m SCSI interfaces of a storage location selected from a storage area in each of said m disk drives, respectively. The Examiner takes Official Notice that in the art of computer systems and disk drives it is well known to use a SCSI bus to connect a hard disk to a controller. For example, many desktop computers have a SCSI bus and SCSI devices connected to it. It would have been obvious to one of ordinary skill at the time of the invention to include the SCSI interface into the combined system of Masuyama et al and Chen et al. A person of ordinary skill in the art would have been motivated to make the modification because SCSI is a well-known accepted standard that is used in disk arrays. Using a SCSI in the combined system of Masuyama et al. and Chen et al. would make it more versatile and compatible with other systems.

3. Claims 5-9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuyama et al., U.S. Patent 6,397,347 B1, and further in view of Yamamuro, U.S. Patent 5,841,748.

Referring to claim 5:

a. In column 4, lines 10-22, Masuyama et al. disclose a disk array with data and redundant data distributed across the array.

b. In column 4, lines 28-34, Masuyama et al. disclose that the disk array apparatus of this invention has a structure such that, if an abnormality or an error occurs in one of the disk units which will be referred to as a faulty disk unit, a part of the distributed data stored in the faulty disk unit is correctly reconstructed by the use of the remaining part of the distributed data, including the redundant data, stored in the remaining disk units (a parity calculation part operating calculation of parity from (m-2) of the data blocks and the redundant data to recover one remaining data block).

a. In column 4, lines 60-64, Masuyama et al. disclose that the reading operation in which the abnormality has occurred is executed again to confirm whether or not the abnormality again occurs. If no abnormality occurs, occurrence of the abnormality is simply recorded without carrying out any further special processing. Further, in column 7, lines 11-16, Masuyama et al. disclose assigning an alternate position. However, Masuyama et al. don't explicitly disclose that in response to said first read request sent thereto, referring to a faulty block table and determining whether or not (m-1) of the disk drives have

previously failed to read each of the data blocks. In the Abstract, Yamamuro discloses that the physical address data of the first sector of the ECC block having the defective sector and the physical address data of the first sector of the replacement ECC are recorded in the form of a secondary defect list. It would have been obvious to one of ordinary skill at the time of the invention to include the secondary defect list of Yamamuro into the system of Masuyama et al. A person of ordinary skill in the art would have been motivated to make the modification because the secondary defect list permits data to be continuously reproduced when successive data items such as speeches or moving pictures are reproduced even if a defect replacing process is effected at the manufacturing time or at the initial time, such as the application starting time (see Yamamuro: col. 1, lines 60-65).

c. In column 6, lines 12-19, Masuyama et al. disclose that when the instruction is a reading instruction, the first through the fourth disk controllers read the stored data from the first through the fourth disk units, respectively, and deliver the stored data to the disk array controller. The disk array controller assembles the stored data into read data as a reproduction of the write data and delivers the read data to the host computer (when determining that the (m-1) disk drives have not previously failed to read each of said data block, issue second read requests to said (m-1) disk drives to read only each of the data blocks; and when the data blocks are read from said (m-1) disk drives, execute an operation for transmitting the data to the host device).

d. In column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller. The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode (when determining that the (m-1) disk drives have previously failed to read each said data block, issues second read requests to said m disk drives to read (m-1) of said data blocks and the redundant data).

Referring to claim 6, in column 4, lines 28-34, Masuyama et al. disclose that the disk array apparatus of this invention has a structure such that, if an abnormality or an error occurs in one of the disk units which will be referred to as a faulty disk unit (when said (m-1) disk drives complete reading, detects whether or not a set of the data blocks and the redundant data has been read from the (m-1) disk drives), a part of the distributed data stored in the faulty disk unit is correctly reconstructed by the use of the remaining part of the distributed data, including the redundant data, stored in the remaining disk units (when detecting that the set of the data blocks and the redundant data has been read, issue a recovery instruction to said parity calculation part to recover the one remaining data block not read from one remaining disk drive of said m disk drives; and when the one remaining data block is recovered by the calculation of parity in said parity calculation part, execute an operation for transmitting the data to the host device).

Referring to claim 7, in column 7, lines 6-16, Masuyama et al. disclose that stored data stored at a position where the abnormality has occurred are rewritten to recover a state such that the stored data can be normally read. The use of a faulty position is inhibited and an alternate position is assigned as internal processing. This operation is called reassignment (a table for registering therein a recording area of a data block which has previously failed to be read by said (m-1) disk drives). Further, in column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller. The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode (wherein said control part is operable to determine whether to issue the second read requests to said (m-1) disk drives or to said m disk drives.

Referring to claim 8, in column 7, lines 6-16, Masuyama et al. disclose that stored data stored at a position where the abnormality has occurred are rewritten to recover a state such that the stored data can be normally read. The use of a faulty position is inhibited (said control part is operable to delete the defective recording area of the data block from the table) and an alternate position is assigned as internal processing. This operation is called reassignment (a reassignment part operable to, when a defect occurs in a recording area of one of the data blocks or the redundant data in said m disk drives execute reassign processing for assigning an alternate

recording area to the defective recording area, wherein said reassignment part assigns the alternate recording area to the defective recording area of the data block registered in said table by said reassignment part).

Referring to claim 9:

a. In the Abstract, Yamamuro discloses that the physical address data of the first sector of the ECC block having the defective sector and the physical address data of the first sector of the replacement ECC are recorded in the form of a secondary defect list (a first table storage part operable to store a first table for registering an address of the alternate recording area reserved in each of said m disk drives as alternate recording area information and a second table part operable to store a second table for registering address information of the alternate recording area assigned to the defective recording area).

b. In column 4, lines 35-50, Masuyama et al. disclose occurrence of the abnormality is detected on a data writing operation or a data reading operation responsive to the data writing instruction or the data reading instruction from the host computer. Further, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a particular disk unit within a predetermined time period is detected (wherein said reassignment part is operable to: when the second read requests are transmitted from said control part to said m disk drives measure a delay time in each of said m disk drives; determine whether or not each of the recording areas of the data blocks

and the redundant data to be read by each of the second read requests is defective based on the measured delay time).

c. In column 7, lines 6-16, Masuyama et al. disclose that stored data stored at a position where the abnormality has occurred are rewritten to recover a state such that the stored data can be normally read. The use of a faulty position is inhibited and an alternate position is assigned as internal processing. This operation is called reassignment (when determined that the recording area is defective, assign the alternate recording area to the defective recording area based on the alternate recording area information registered in the first table of said first table storage part).

d. In the Abstract, Yamamuro discloses that the physical address data of the first sector of the ECC block having the defective sector and the physical address data of the first sector of the replacement ECC are recorded in the form of a secondary defect list (register the address information of the assigned alternate recording area in the second table of the second table storage part, said control part is operable to issue the second read requests based on the address information registered in the second table of said second table storage part).

e. In column 4, lines 35-50, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a particular disk unit within a predetermined time period is detected (said delay time is a time period calculated from a predetermined process start time).

Referring to claim 16, in the Abstract, Masuyama et al. disclose a disk array apparatus. However, Masuyama et al. don't explicitly disclose that the disk array device further comprises m SCSI interfaces corresponding to said m disk drives, and wherein said control part is operable to notify each of said m SCSI interfaces of a storage location selected from a storage area in each of said m disk drives, respectively. The Examiner takes Official Notice that in the art of computer systems and disk drives it is well known to use a SCSI bus to connect a hard disk to a controller. For example, many desktop computers have a SCSI bus and SCSI devices connected to it. It would have been obvious to one of ordinary skill at the time of the invention to include the SCSI interface into the combined system of Masuyama et al. and Yamamuro. A person of ordinary skill in the art would have been motivated to make the modification because SCSI is a well-known accepted standard that is used in disk arrays. Using a SCSI in the combined system of Masuyama et al. and Yamamuro would make it more versatile and compatible with other systems.

4. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Masuyama et al., U.S. Patent 6,397,347 B1 and Chen et al., U.S. Patent 5,968,182 as applied to claim 1 above, and further in view of Yamamuro, U.S. Patent 5,841,748.

Referring to claim 11:

a. In column 7, lines 11-16, Masuyama et al. disclose assigning an alternate position. However, Masuyama et al. don't explicitly disclose having a first table storage part operable to store a first table for registering an address of the

alternate recording area reserved in each of said m disk drives as alternate recording area information; and a second table storage part operable to store a second table for registering address information of the alternate recording area assigned to the defective recording area. In the Abstract, Yamamuro discloses that the physical address data of the first sector of the ECC block having the defective sector and the physical address data of the first sector of the replacement ECC are recorded in the form of a secondary defect list. It would have been obvious to one of ordinary skill at the time of the invention to include the secondary defect list of Yamamuro into the combined system of Masuyama et al. and Chen et al. A person of ordinary skill in the art would have been motivated to make the modification because the secondary defect list permits data to be continuously reproduced when successive data items such as speeches or moving pictures are reproduced even if a defect replacing process is effected at the manufacturing time or at the initial time, such as the application starting time (see Yamamuro: col. 1, lines 60-65).

b. In column 4, lines 35-50, Masuyama et al. disclose occurrence of the abnormality is detected on a data writing operation or a data reading operation responsive to the data writing instruction or the data reading instruction from the host computer. Further, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a particular disk unit within a predetermined time period is detected (wherein said reassignment part is operable to: when the second read requests are transmitted from said

control part to said m disk drives measure a delay time in each of said m disk drives; determine whether or not each of the recording areas of the data blocks and the redundant data to be read by each of the second read requests is defective based on the measured delay time).

c. In column 7, lines 6-16, Masuyama et al. disclose that stored data stored at a position where the abnormality has occurred are rewritten to recover a state such that the stored data can be normally read. The use of a faulty position is inhibited and an alternate position is assigned as internal processing. This operation is called reassignment (when determined that the recording area is defective assign the alternate recording area to the defective recording area based on the alternate recording area information registered in the first table of said first table storage part).

d. In the Abstract, Yamamuro discloses that the physical address data of the first sector of the ECC block having the defective sector and the physical address data of the first sector of the replacement ECC are recorded in the form of a secondary defect list (register the address information of the assigned alternate recording area in the second table of the second table storage part, wherein said control part is operable to issue the second read requests based on the address information registered in the second table of said second table storage part).

e. In column 4, lines 35-50, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a

particular disk unit within a predetermined time period is detected (said delay time is a time period calculated from a predetermined process start time).

Referring to claim 12, in column 4, lines 60-64, Masuyama et al. disclose that the reading operation in which the abnormality has occurred is executed again to confirm whether or not the abnormality again occurs. If no abnormality occurs, occurrence of the abnormality is simply recorded without carrying out any further special processing (said reassignment part is operable to assign the alternate recording area to the defective recording area only when determining successively a predetermined number of times that the recording area is defective).

Referring to claim 13, in column 4, lines 35-50, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a particular disk unit within a predetermined time period is detected (said predetermined process start time is a time when each of the second read requests is transmitted to each of said m disk drives).

Referring to claim 14, in column 4, lines 35-50, Masuyama et al. disclose detecting an abnormality through a timeout event such that no response is returned from a particular disk unit within a predetermined time period is detected (said predetermined process start time is a time when said m disk drives start reading based on the second read requests).

***Response to Arguments***

5. Applicant's arguments filed April 15, 2004 have been fully considered but they are not persuasive.

6. On page 53, under the section Remarks, the Applicant argues, "Masuyama does not disclose or suggest that the controller 21 can detect a disk unit of the four disk units 41-1 – 41-4 from which reading of either a data block or redundant data is no longer necessary and issue a read termination command to terminate reading of a current data block or redundant data by the detected disk unit of the four disk units 41-1 – 41-4, wherein the detected disk unit is enabled to commence reading of a subsequent data block or redundant data without being disconnected from the disk array device." The Examiner respectfully disagrees. In column 6, lines 20-34, Masuyama et al. disclose that upon detection of occurrence of an abnormality or an error the detector/memory section delivers the faulty unit information to the disconnection managing section of the temporary degenerate mode disk array controller. The disconnection managing section temporarily disconnects from the disk array apparatus the particular disk unit as a faulty disk unit and makes the disk array apparatus operate in a temporary degenerate mode. Further, in column 4, lines 35-50, Masuyama et al. disclose that a timeout event such that no response is returned from the particular disk unit within a predetermined time period is detected. In this case, the particular disk unit is temporarily disconnected from the disk array apparatus as a faulty disk unit and the disk array apparatus is operated in a temporary degenerate mode. It is apparent that it is no longer necessary to read from the faulty disk unit since it is temporarily disconnected from the disk array apparatus. In other words, if the disk is temporarily disconnected and data can be reconstructed from the remaining disks and parity, is it no longer necessary to read data from the disconnected disk? The answer is yes. The Examiner suggests that the Applicant

better define what exactly is meant by determining that reading is no longer necessary and amend the claims accordingly.

7. On page 54, under the section Remarks, the Applicant argues, "However the faulty disk unit is detected when the detector/memory section 211 detects a fault, abnormality or occurrence of timeout event and not when the reading from the faulty disk unit is no longer necessary." Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. The Applicant never specifically points out the difference between detecting a faulty disk and no longer reading from it and not reading a disk unit when it is no longer necessary. The Examiner believes that they are equivalent for at least the arguments above.

8. On page 55, under the section Remarks, the Applicant argues, "Therefore, Chen also fails to disclose or suggest a control part operable to detect a disk drive from which reading of either the data block or the redundant data is no longer necessary, and issue a read termination command to terminate reading of a data block or redundant data by the detected disk drive. In addition, the fact that the long device busy signal isolates the storage device from all hosts, the storage device necessarily is not enabled to commence reading of any subsequent data block or redundant data without being disconnected from the disk array device." The Examiner respectfully disagrees. This statement by the Applicant is incorrect. In column 5, lines 1-12, Chen et al. clearly disclose that after the long busy signal, the disk may be read again and this is done to

prevent premature faults. Contrary to Applicant's belief, the disk is **never** disconnected and is permitted to be read again.

9. On page 20, under the section Remarks, the Applicant argues, "The primary and secondary lists of Yamamuro are not disclosed or suggested as being referred to for determining whether (m-1) of m disk drives have previously failed to read each data block or not. Further, there is no disclosure or suggestion in Yamamuro that second read requests are issued to the (m-1) disk drives to read only each of the data blocks when determining that the (m-1) disk drives have not previously failed to read each of the data blocks." The Examiner respectfully disagrees. It is well known that an inability to read a data block is considered a fault and is registered in the secondary defect list. This is usually due to the fact that the data block is corrupted. Further, it is well known to consult a secondary defect list to determine which blocks have failed before attempting to read a disk. Therefore, Yamamuro does teach determining whether (m-1) of m disk drives have previously failed to read each data block or not; and that second read requests are issued to the (m-1) disk drives to read only each of the data blocks when determining that the (m-1) disk drives have not previously failed to read each of the data blocks.

***Conclusion***

10. This is a continuation of applicant's earlier Application No. 09/453,216. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL**

even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Maskulinski whose telephone number is 571-272-3649. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 571-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Maskulinski

Michael C Maskulinski
Examiner
Art Unit 2113